Industry
Noise - Goals

- Attainment of goals will provide technology needed to meet industry environmental concerns
- Affordability, safety, and emissions goals must be simultaneously addressed with noise
- 20 dB may be more than needed for light aircraft
  - Absolute minimum noise goal?
- Other aircraft types? GA, turboprop, rotorcraft

Industry
Emissions - Goals

- We can’t answer this at this time - requirements for emissions aren’t yet clear

Operators Goals

- No, need more short-term/intermediate goals/ solutions
- Need improved modeling/forecasts
- Need improved communications
  - With community
  - With industry
- Need national strategy
  - Technical
  - Regulatory

NGO/Community Goals

- Generally, yes - It will go a long way toward meeting these concerns
- Regarding NOx - Are we using the right measurement tools?
  - Exclusive focus on LTO cycle may not be appropriate proxy on tropospheric & stratospheric NOx emissions
- 25% reduction in CO_2 may not be enough

NGO/Community Goals

- Need a clearer connection between research goals & real-world impact
- Control of aircraft noise within compatible land use
- Producing aircraft 10-20 dB quieter than today's aircraft is important, but in the short-term, it doesn't meet the NGO concerns due to existing fleet composition & increased levels of operational growth

Industry
Noise - Strategy

- Gap Analysis defines strategy
- Enabling technologies for all components of transport aircraft noise are adequately addressed
- Other aircraft types?
- Let system studies guide revolutionary concepts for noise reductions

Industry
Emissions - Strategy

- Focus on total airplane/engine efficiency improvements. Reduced fuel-use reduces all emittants. Need to ensure funding of all technologies that reduce fuel burn, to TRL 6 (including lessons from the past)
- General elements of strategy from Gap Analysis chart are reasonable - aero performance, airframe structure/materials, and engine performance
- Drop plans for low C/H ratio fuel work - go all the way to non-carbon fuels

Operators Strategy

- Advocacy by interest groups for assisted funding
- Are resources adequate?
- Strategy, other than technical, is unclear
- Better understanding/definition of emissions & criteria (local)
- Operations emphasis to try to achieve near term benefits

NGO/Community Strategy

- Needs parallel effort to ensure market acceptance & use
- While technology is being developed, operational & other measures (e.g. retrofits) using current technology need to be employed
- Strategy of concurrently looking at emissions & noise is important
- Coordination with other agencies
- Keep engine certification process in step with technology development

Industry
Noise - Roadmaps

- Near/Far Balance - Stress continuous parallel evolution of quieter components & airplanes
- Leverage - Excellent flow from AST - Must tie with aerodynamic, structures, CNS/ATM, etc.
- ASAP technologies - GAP analysis & Roadmaps define order of technology development

Industry
Emissions - Roadmaps

- Near/Far Balance - Need funding profile; near-term focus on carbon fuel
- Leverage - yes
- ASAP Technologies - Efficiency-related technologies (i.e. materials, cycle, aero performance)

Operators Roadmaps

- Prioritize program technologies
- Emissions?- No, more near-term (5 years)
- Noise?-Yes
- FAA/NASA CNS/ATM coordination is not reflected on roadmap
- Need to show interdependent roadmaps for other NASA goals
- Examine military programs

Operators Roadmaps

- Local air quality modeling (quantifying levels & dispersions of emissions)
- Identify which noise programs adversely impact emissions & vice versa
- Improve accuracy of noise models
- Improved operations through CNS/ATM, for example

NGO/Community Roadmaps

- Support adding 30 to 40-year goals for zero emission aircraft, but not as trade-off for near-term goals
- NASA has critical role to play in a basic R&D program, and in ‘thinking outside the box”!
- There is need for NASA to take lead in such an effort. We support NASA initiative to have MOVs with OFAs
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NGO/Community Roadmaps

- Technologies
  - Agree with operational improvements
  - Support AST program
  - Retrofits of existing engines
  - Try to apply Dual Annular Combustor to other engines

Industry Noise & Emissions Moving Forward

- AST Noise Reduction Program provides excellent model for NASA/Industry cooperation
  - Form small NASA/Industry focus group to define and guide the program
  - Form Technical Working Group/Steering Committee to maintain program focus & review progress

Operators Moving Forward

- 6 Month progress reports
  - Form non-NASA ad hoc steering committee
  - Maintain web site (update)
  - NASA needs to pursue active outreach to other organizations (I.e. ATA, AAAE, ACI, ICAO, IIAWG, etc.)

Operators
Moving Forward

- Airport operators & airlines will provide to the extent possible:
  - Educational outreach
  - Be a test bed
  - Provide data
  - Host & attend meetings
  - Critiques
  - Steering committee participation
  - Etc…ask us!

Operators
Moving Forward

- 6-month progress report
  - Status by category
  - Programmatic/administrative obstacles
  - Data & test results (list of technical papers)
  - Information for related programs (partnerships, etc.)
  - Names & points of contact

NGO/Community Moving Forward

- Important & valuable to continue communication in form that would include two-way exchange of information & ideas
- FACA-type of exchange has value, but should not be only form of communication considered by NASA
- Printed reports & electronic info (website) are very useful
- Use plain English (layman's language)
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NGO/Community Moving Forward

- Provide opinions & review proposed programs
- Provide awareness of public concerns & expertise on environmental & public health & welfare issues
- Increase public awareness of the effect of not addressing environmental problems
- Help educate decision makers
- Additional forums for discussion